Space Weather Forecast

Issued on Saturday, 30 March 2024 at 01:13 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Further Moderate flares expected from large sunspot region (R1-R2 Blackouts). Chance of Strong flares (R3+ Blackouts). Activity easing Day 3 (01 Apr).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity has been Moderate with occasional Moderate class flares, the greatest intensity peaking at 29/0230 UTC from complex region in the southwest disc. This very large and magnetically complex region is currently approaching the southwest limb, and its location restricts the viewing angle and reduces confidence in analysis. However, the trailing portion has continued to show development with well-defined mixed magnetic configurations.
Flare activity has produced a number of coronal mass ejections (CMEs) over the past 24 hours, however analysis would suggest that none of these are expected to be Earth-directed. A prominence eruption from the southeast limb was observed around 29/2100 UTC and is awaiting imagery for analysis. However, its location would imply that any ejecta would miss Earth.

Solar Wind / Geomagnetic Activity: The solar wind was indicative of ongoing ambient slow wind conditions. Winds speeds eased from slightly elevated, around 400km/s to background 340 km/s. Interplanetary Magnetic Field was weak, with its north-south component also only varying weakly. Geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) continued to be slightly above background and declining, and well below Radiation Storm levels. This is due to the ongoing effects of the Moderate Radiation Storm that peaked on 24 Mar.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate to High activity with further Moderate class flares expected, and a chance of isolated Strong class flares from the large sunspot region on the disc. This region is expected to depart the disc during Day 1 (30 Mar) with flare risks reducing significantly as the region becomes far-sided. However, any notable Strong flares may remain observable into Day 3 (01 Apr). No new or returning regions are expected to rotate onto the disc during the period.

Solar Wind / Geomagnetic Activity: There are no Earth-directed coronal mass ejections (CMEs), although there is a slight chance that recent CME activity may produce a glancing blow during Day 1 (30 Mar). Background winds at first have the potential to become slightly enhanced day 3 (31 Mar) from the arrival of any fast wind from small coronal holes. Any connection to these features are expected to be limited however. Mainly Quiet (Kp 0-2) geomagnetic activity forecast, with a chance of Unsettled (Kp 3) and a slight chance of Active (Kp 4) intervals with the onset of the faster solar winds or the arrival of a glancing CME blow.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to continue easing to background, with a slight chance of a further enhancement above the S1/Minor Radiation storm level given any notable flares from the large sunspot on the southwest limb.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	70	60	30	10
Very Active	R3 to R5 X	No	30	20	5	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	20	20	20	5
Very Active	≥ S3 *	No	5	5	5	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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